

Thesis Title A Study of the Addition Reaction of Photosensitive Acid onto Epoxidised Liquid Natural Rubber (ELNR) and its Photosensitivity.

Name Chantima Deeprasertkul

Degree Master of Science (Polymer Science)

Thesis Supervisory Committee

Pranee Phinyocheep, Doctorat de l'Universite' du Maine

Orapin Phaovibul, Dr.rer.nat.

Krisda Suchiva, Ph.D.

Date of Graduation 17 May B.E. 2537 (1994)

### ABSTRACT

Epoxidised liquid natural rubber (ELNR) was prepared by depolymerization of natural rubber in latex phase by using phenylhydrazine/oxygen system, followed by in-situ peroxyformic acid epoxidation.

The study of addition reaction of photosensitive acid; acrylic acid, methacrylic acid and cinnamic acid onto ELNR has been carried out into 2 systems : at high temperature and at room temperature.

The evolution of the reaction was followed by determination of the residual acid at different time by potentiometric titration or IR spectroscopy. It was found that type and concentration of catalysts, type and concentration of acids and temperature affected the rate of the addition reaction and %conversion. Acrylic acid gave the best result in both cases.

The photosensitivity of the ELNR grafted with the photosensitive acids in the presence or absence of benzophenone acted as photoinitiator under UV irradiation were studied by IR and UV spectroscopic methods. It was found that benzophenone accelerated the photocrosslinking reaction. Physical properties of the cured films such as adhesion and hardness were also investigated.